Alcatel-Lucent 7515 Media Gateway

Release 2.4 build 122

Release Note

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1. General Description

As one of the key components of Alcatel-Lucent's Next Generation Network portfolio, the Alcatel-Lucent 7515 Media Gateway (MG) provides seamless inter-working of voice and fax connections between the Public Switched Telephone Network (PSTN) and Internet Protocol (ip) networks. By enabling voice services to ride over data networks, the service can maximize the value of current investments while enabling future service rollout to incorporate the latest technologies.
The Alcatel-Lucent 7515 MG combines the reliability and simplicity of voice with the speed and efficiency of data networks. It features an advanced architecture and interface optimized for packet voice applications, together with carrier class reliability, availability and quality.

As a single platform, the Alcatel-Lucent 7515 MG supports multiple media gateway applications and facilitates the evolution of the PSTN towards a Voice over Packet network. Based on its native TDM switching and Voice over Packet capabilities, the Alcatel-Lucent 7515 MG can be used as Trunking GW, Signaling GW.

Using open and standardized signaling and control protocols such as Megaco/H.248 and SIGTRAN, it can be deployed with Alcatel-Lucent softswitch platform as well as integrated into any multi-vendor next generation network.

The 7515 MG release 2.4 follows release 2.3 and provide support of new H248 stack (v2), as well as some important security featues.

2. Release information

Software package (m24B0122)
http://172.24.140.22/online/tec/gw/7515M/swm2.4.htm

```
==========================================
A7515M Version 2.4 B01 (Build 22) -- LOAD MODE: AUTO 1  PF: M24B0122.PAK *
------------------------------------------------------------------------
 [View: beil_7515M_R24_int]
 [GWTOOLS & GW7515 Baseline: 7515M_R24_09_03_2009 7515M_R24_05_06_2008.7575
7515M_R2.4_2009-7-28.5774 7515M_R24_09_03_2009.134]
 Built by Gateway Buildmanagement (beil) @ Thu Sep  3 17:15:07 2009----------
----------------------------------
 Boot Rom -- 2.4
 Built by Gateway Hardware (Waterj) @ Mon Jan 31 11:11:05 2005
==================================================
```

Files included in this package are:

- m24B0122.pak
- dspfw_0.axf
- config.txt
- 7515_2.4_B122_Release_Note.pdf

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Element manager and alarm manager package(same as M2.3)
http://172.24.140.22/online/tec/gw/7515M/swmem2.3.htm

3. Referenced documents

7515 Media Gateway Operation Guide (R2.4)	3FZ044736013_ACZZA
7515 Media Gateway Quick Start Guide (R2.4)	3FZ044736006_ACZZA
7515 MG Production Description (R2.4)	3FZ044736015_ACZZA
7515 MG Operations and Maintenance Manual (R2.4)	3FZ044736001_ACZZA
7515 Media Gateway EMS User Manual (R2.4)	3FZ044736020_ACZZA
7515 Media Gateway ECO Declaration(R2.4)	3FZ044736022_ACZZA

4. Functionality

4.1 new feature in build 122

4.1.1 new mib synchro with OMC-P

4.2 new feature in build 121

no new feature, just some corrections.

4.3 new feature in build 120

no new feature, just some corrections.

4.4 new feature in build 119

no new feature, just some corrections.

4.5 new feature in build 116

no new feature, just some corrections.

4.6 new features in release 2.4

4.6.1 H.248.14 (heartbeat)
4.6.2 H.248v2
4.6.3 MG/MGC originated Pending limits
4.6.4 IP Filter (firewall)
4.6.5 IP security
4.6.6 TDM2TDM SPC

4.7 New Features Overview

4.1.1 new mib synchro with OMC-P

The alarm module of media gateway collects the alarm events accruing in the FSB card, and is designed to report to the EM when trap occurs. The EM should also have the ability to get the alarm information initiatively.

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A7515 add an interface for the alarm module to support GET\GETNEXT the AAL(Active Alarm List) and AH(Alarm History). Each module in 7515 interacts with the alarm module for its trap messages, then trap transfer work from modules to the alarm module will integrate the traps and will unify them to the unified X733 format.

Also, the mib file have added to support snmpX733AlarmTrap.
UI command:
Main# define snmp trap state all enable ---------- ①
Main# define snmp trap state 22 {enable/disable} ---------- ②

The default value only support the new mib added, can support both the old and new mibs by the UI "①", after UI "①",then UI "②" will only support the old mib.

NOTE: this configure change will not be saved if system reboot.

4.5.1 H.248.14 (heartbeat)

H.248 Inactivity Timer package contains an event that can be implemented by a MGC and by a MG on its root termination. The purpose of the event is to allow the MG to detect periods of silence of messaging from the MGC. Once the period of silence exceeds the threshold provided in the event, the MGC is notified.
If the MGC has failed, the event will not receive a reply. If no reply is received, the MG will consider the MGC to have failed and will follow the procedures of 11.5/H.248.1.

UI command:
Main# define mgw mg heartbeat state {enable|disable|MGCControl|Forced}

Main# define mgw mg heartbeat value <seconds>

Mian# define mgw mg svc-heartbeat {root|heartbeat}

Main# define mgw mg inactiv-timer{enable|disable|Forced}

4.5.2 H.248V2

In consider of capability, H.248v2 contains two kind of support to H248 protocol which has different versions and the work mode of trillium can be customized by user in user interface. Further more, after the trillium has upgraded to v1.5 from v1.3

UI command:
Main# define mgw mg h248-version {1/2}

4.5.3 MG/MGC Originated Pending Limits

If some transactions are complex enough to need very long time to process or something goes wrong in MG/MGC processing these transactions, the trillium will send pending message to MGC/MG to indicate the transaction is been processing. But the problem is the pending messages can't keep sending until MG/MGC finishes the processing. If there is something wrong with transaction processing and the process may be endless and the pending messages will be endless either.

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So, it is necessary to set limits of sending pending messages. This feature resolves this problem.

UI command:
Main# define mgw mg mgPendLimit <Nr of times>

Main# define mgw mg mgcPendLimit <Nr of times>

4.5.4 IP Filter （Firewall）

IP Filter feature in 7515 R2.4 is to modify the default action to drop packet when a packet arrives but cannot match any filter rule.

In the new implementation, if IP filtering is enabled but packet is not matched to any filter, packet will be dropped. We recommend configure the ip filter rules traffic by traffic and reduce the range of source IP addresses to minimize the security risk.

UI Command:
Main# create ip filter <filter-name> <priority> <action> {<protocol>|any}
{<src-ip/mask>|any}:[<ports>]
{<dst-ip/mask>|any}:[<ports>] [<nexthop-addr>]

Main# remove ip filter <filter-name> [<vpnid>]

Main# define ip filter <filter-name> {enable|disable}

Main# define ip filter state {<filter-name>|all} {enable|disable} [<vpnid>]

Main# view ip filters all

Main# view ip filter cache [<srcip> <dstip>]

Main# view ip filter configuration

Main# view ip filter statistics [<vpnid]

Main# clear ip filter cache

Main# clear ip filter statistics [<vpnid>]

Main# define ip filter port <filter-name> <port> {inbound|outbound|both} <vpnid>

Main# clear ip filter port <filter-name> [<vpnid>]

4.5.5 IP Security

7515 MGW should have the basic ability to prevent itself from Signaling/Data DOS attack according to Alcatel-Lucent Security Policy [4].
In 7515 R24, only flooding protection for Protocol will be implemented, when flood attack, this mechanism reduces the system performance. To reduce the CPU occupancy when protecting MGW from flooding attack

UI command:
Main# diag define ip flooding protocol flag {enable|disable}

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Main# view ip flooding protocol thresholds {sctp|udp|tcp|icmp|ip|all}

Main# view ip flooding protocol statistics {sctp|udp|tcp|icmp|ip|all}

Main# clear ip flooding protocol statistics {sctp|udp|tcp|icmp|ip|all}

Main# define ip flooding protocol thresholds {sctp|udp|tcp|icmp|ip|all}

Main# diag define ip flooding protocol flooding-rate {sctp|udp|tcp|icmp
|ip|all} <Action>

Main# diag define ip flooding protocol load-factor {sctp|udp|tcp|icmp|ip|all}

Main# diag view ip flooding protocol load-factor {sctp|udp|tcp|icmp|ip|all}

Main# diag view ip flooding protocol load-info {sctp|udp|tcp|icmp|ip|all}

4.5.6 TDM2TDM SPC

1.setup/release Semi Permanent Connections (SPC) between two TDM-ports (native TDM hairpinning without media processing) via UI-commands

2. SPCs must be self healing in case of link up.
3. No service degradation in case of FSB-Takeover (SPC-Mgr data must be synchronized to standby FSB).
4. maximum number of spc is: 2*32 =64.

UI command:
Main# create spc tdm2tdm media none <IDENTIFIER> <LPA1> <LPA2>

Main# remove spc <IDENTIFIER>

Main# view spc tdm2tdm

4 Improvement since last release

4.1 Corrections in build 122

GW1_00161356	alarm synchron

4.2 Corrections in build 121

GW1_00155900	when disable lapd link no REL_IND send out
GW1_00154685	IOT: not send SC=905 for MTP2 and LAPD link
GW1_00152576	IUA_IOT: 7515 check TEI parameter

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4.3 Corrections in build 120

GW1_00122007	digit value not report if s=0 in digitmap message
GW1_00120742	ring back tone can not be played to PCM side

4.4 Corrections in build 119

GW1_00118740	memory leak when h248+m2ua low traffic
GW1_00105173	H248 unreasonable handoff
GW1_00105070	H248 registration state comes into chaos

5 Installation and Upgrade Procedures

5.1 Upgrade from Rel2.3 to Rel2.4

1. **setup tftp server to download software package**
2. **prepare serial connection to active FSB board via CRAFT port (baud rate is 115200)**

Below command can help to know which FSB board is active.

```
==========================================
My-Chassis:ACT-FSB:1.1(r0)>=10:diag:main# vi ch
-----------------------------------------------------------------
Ch VB-Sl    VB-Type   State    Function     LBI    VM-Type
-----------------------------------------------------------------
1  2        VBSCM     UP       STANDBY-UP          VMSCM
1  1        VBSCM     UP       ACTIVE-UP   * scm    VMSCM
-----------------------------------------------------------------
====================================
```

3. **backup the system files before upload the new files**

*.pak, config.txt and dspfw_0.axf should be backup on two FSB boards by command

main# rename <current-name> <new-name>

For example:
My-Chassis:ACT-FSB:1.1(r0)>=13:diag:main# rename config.txt config.old

4. **upload *.pak, config.txt and dspfw_0.axf**

upload the file by command

main# tftp get <ip_addr>:rmt-file lcl-file

For example:
My-Chassis:ACT-FSB:1.1(r0)>=16:diag:main# tftp get 10.10.0.61:config.txt

The standby FSB board can only download files from the active one . 7515 assigns different internal ip address to two board , “200.1.1.33” for board 1.1 ,and “200.1.1.34” for board 1.2. So ,if download files from board 1.1 to board 1.2 ,you can issue:

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My-Chassis:rem-cons:STB-FSB:1.2(r0)>=2:sduc:main# tftp get 200.1.1.33:<file>

5. **define nvram to boot up system**

Main# define nvram pf <pf1> <pf2>

Access to the standby FSB to define nvram, and make sure the two boards use the same *.pak files.

To check whether filename on two boards is right by below command

Main# view nvram

Then reboot system without “save”. After the rebooting complete, use “ view version “ on both FSB and check if the version is right.

5.2 Upgrade inbetween Rel2.4

1. **setup tftp server to download software package**
2. **prepare serial connection to active FSB board via CRAFT port (baud rate is 115200)**

Below command can help to know which FSB board is active.

```
==========================================
My-Chassis:ACT-FSB:1.1(r0)>=10:diag:main# vi ch
------------------------------------------------------------
Ch VB-Sl    VB-Type   State    Function     LBI    VM-Type
------------------------------------------------------------
1  2        VBSCM     UP       STANDBY-UP          VMSCM
1  1        VBSCM     UP       ACTIVE-UP   * scm    VMSCM
------------------------------------------------------------
====================================
```

3. **backup the system files before upload the new files**

*.pak, config.txt and dspfw_0.axf should be backup on two FSB boards by command

main# rename <current-name> <new-name>

For example:
My-Chassis:ACT-FSB:1.1(r0)>=13:diag:main# rename config.txt config.old

4. **upload *.pak, config.txt and dspfw_0.axf**

upload the file by command

main#   tftp get <ip_addr>:rmt-file lcl-file

For example:
My-Chassis:ACT-FSB:1.1(r0)>=16:diag:main# tftp get 10.10.0.61:config.txt

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The standby FSB board can only download files from the active one . 7515 assigns different internal ip address to two board , “200.1.1.33” for board 1.1 ,and “200.1.1.34” for board 1.2. So ,if download files from board 1.1 to board 1.2 ,you can issue:

My-Chassis:rem-cons:STB-FSB:1.2(r0)>=2:sduc:main# tftp get 200.1.1.33:<file>

5. **upgrade system by**
define nvram to boot up system (same as above)
or
upgrade system non-hitless *.pak

After the rebooting complete, use “ view version “ on both FSB and check if the version is right.

6 Software licensing keys

7515 follows a simple license schema based on hardware and software package.
The 7515 software package (PAK) contains all software licenses required for field operation.

Corresponding license keys are acquired by purchase of the software package or the hardware boards respectively.

7 HW Requirements

The package is released with the following HW configurations (backward compatible hardware as supported also by software Rel2.3)

Description	Mnemonic	Code
Forwarding System Processl Module - C5 Processor Upgrade version of 3FZ30062AAAA.	FM-SPM-C5	3FZ30062AAAB (3FZ30062AAAA)
PSTN Interface w/ 8 E1/T1 and Packet Interface w/2 10/100 mbps routed Fast Ethernet ports	FM-WIM-8E1/2FE	3FZ30063AAAB (3FZ30063AAAA)
Universal DSP Module - 240 channels G.711	PM-UMS-240	3FZ30064ABAA
Universal DSP Module - 480 channels G.711	PM-UMS-480	3FZ30064AAAA
Universal DSP Module - 480 channels G.711, 400 channels G.729	PM-UMS-960	3FZ30064ADAA
The blank panel for FM-SPM-C5/FM-WIM-8E1/2FE board.When a slot is not filled by a board, it should be covered by this panel to provent the dust.	CE-Blank-Panel	3FZ40093AAAA
Front-Left Fan Tray	CE-FAN-Front-Left	3FZ40084AAAC
Front-Right Fan Tray	CE-FAN-Front-Right	3FZ40085AAAC
Rear Fran Tray	CE-FAN-Rear	3FZ40086AAAC
DC Power Tray, 48V, 10A	CE-PSU-DC	3FZ40087AAAC
2U A7515 Shelf - Full configuration (including 1 chassis(3FZ50047ABAC), 3 Fan Tray(3FZ40084,85,86AAAC) & 1 PowerTray(3FZ40087AAAC))	CE-SHF-7515-FL	3FZ50048AAAC

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Table 7-1 Supported Hardware

Optional Elements: Cables	Mnemonic	Code
Cable to connect to E1/T1 port of the FM-WIM-8E1/2FE, 3 Metre. Interface: RJ45 to RJ45(need work with Impedence Converter)	CE-CAB-E1/T1-3	3FZ45012ADAA
Cable to connect to 10/100Mbps Fast Ethernet port of the FM-WIM-8E1/2FE, 6Metre	CE-CAB-FE	3FZ45002AGAA
Cable to connect to Craft Serial port(RJ45) of the FM-WIM-8E1/2FE. Interface: RJ45 to RS232(female)	CE-CAB-CS	3FZ45003ADAA
Cable to connect to external clock input interface of the FM-WIM-8E1/2FE(1.544Mbps),0.5 Metre	CE-CAB-BITS	3FZ45004AAFA
Cable to connect to external clock input interface of the FM-WIM-8E1/2FE(2.048MHz),0.5 Metre	CE-CAB-SSU	3FZ45005AAFA
Power Cable(3 Metres)	CE-CAB-PW	3FZ45009ADAA

Table 7-2 optional elements: cables

8 Restrictions

Following feature restrictions are valid:

8.1 COT on RTP termination via ADD command is not supported

TRANSCATION = 1000{

Context = ${

ADD=TDM/1/1{… signal{ct/ct}},

ADD=RTP/1/0/40000{…}}

8.2 partly support BCG，the direction parameter is not support

8.3 For Digital Map, Z timer is not supported now.

8.4 RTP Hairpining call flow

The supported call flow to setup RTP Hairpining connection is as follows

1. ADD RTP2 (no local control mode restriction)
2. If RTP2 is not SendReceive, MODIFY RTP2 SendReceive
3. MODIFY RTP1 SendReceive

8.5 FSK

andisp/dwa will be assumed to be an on-hook FSK signal, and only support no pattern mode;
andisp/data will be assumed to be an off-hook FSK signal;

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8.6 M2UA:

Following configuration is not supported:
Two AS with Two ASP
AS1 + ASP1:
Same ip addr + 2944
AS2 + ASP2:
same ip addr + 0

8.7 Nework failure feature

Enable RTCP per call based not supported just as Quality alert feature.

Methods to detect network failure are:

a. RTP fraction lost
b. RTCP packet lost
c. DSP statistics

a) For voice call:

- c will be disabled because when remote GW VAD is enabled, network failure event will be misreported.
- a & b is active only when global RTCP is enabled.

b) For fax call:

- only c is valid for this mode.

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